

# NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE STANDARD

## PEST MANAGEMENT

(Acre)  
CODE 595

### **DEFINITION**

Utilizing environmentally sensitive prevention, avoidance, monitoring and suppression strategies, to manage weeds, insects, diseases, animals and other organisms (including invasive and non-invasive species), that directly or indirectly cause damage or annoyance.

strives to balance economics, efficacy and environmental risk shall be incorporated into planning alternatives.

All methods of pest management must comply with Federal, State, and local regulations, including management plans for invasive pest species, noxious weeds and disease vectors.

### **PURPOSES**

Enhance the quantity and quality of commodities.

Minimize negative impacts of pest control on soil, water, plant and animal resources and on humans.

Control undesirable weeds, insects, diseases, animals and other organisms (including invasive species and noxious weeds).

#### **Additional Criteria to Enhance Quantity and Quality of Commodities**

Economic threshold levels for pest control, as established by Penn State Cooperative Extension guidelines or other approved guidelines, will be used to develop plans and recommendations for pest control.

#### **Additional Criteria to Protect Soil Resources**

The type, number, and timing of tillage operations shall be managed to maintain soil loss at or below the soil loss tolerance (T) or other planned soil loss objective and to maintain soil quality. The Revised Universal Soil Loss Equation (RUSLE) shall be used to estimate sheet and rill erosion. The Pennsylvania Soil Conditioning Index can be used to estimate organic matter balance; the Pennsylvania Soil Quality Assessment can be used to evaluate soil condition.

### **CONDITIONS WHERE THIS PRACTICE APPLIES**

Wherever pests will be managed, excepting structural pest control situations.

#### **Additional Criteria to Protect Water Resources**

When a chosen alternative has significant potential to negatively impact water resources, an appropriate set of mitigation techniques must be put in place to address these risks. Mitigation can include substitution of a control tactic with lower risk, or by using additional management or practices that reduces or eliminates negative impacts to water resources.

### **CRITERIA**

#### **General Criteria Applicable to All Purposes**

Plan and implement an integrated approach to pest management that increases the chance of success, reduces reliance on any one tactic, delays resistance to pesticides and reduces the need for emergency actions (which usually involve a limited choice of chemical alternatives). Integrated Pest Management (IPM) principles that

The type, number and timing of tillage operations shall be managed in conjunction with other sediment control tactics and practices to minimize sediment losses to nearby surface water bodies.

### **Additional Criteria When Chemicals or Other Products will be Used**

Read and follow all pesticide label requirements. Label requirements are legal regulations related to the safe handling and use of the product and to minimize negative impacts to non-target organisms, both aquatic and terrestrial, such as fish, birds, bees, beneficial insects and soil microbes. They also contain important instructions to help users apply the product within its capabilities to effectively control the target pests. Pesticide users must maintain appropriate Material Safety Data Sheets (MSDS) and be certified to apply restricted use pesticides if they are used.

Compliance with the Food Quality Protection Act (FQPA); Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); Worker Protection Standard (WPS); and Interim Endangered Species Protection Program (H7506C) is required.

Recommendations for specific pesticides, application rates, levels of crop tolerance, and effectiveness ratings for the target pest(s) shall be in accordance with product label, the Pennsylvania Agronomy Guide and other References for specific crops as listed in this standard.

Evaluate risks of pesticides leaching to groundwater or running off to surface water using information on the product label; the Windows Pesticide Screening Tool (WIN-PST); Pennsylvania Farm\*A\*Syst Farm Evaluation System, Worksheet 2; or other information for soils and pesticides in the Pennsylvania Soil and Water Conservation Technical Guide. When a pesticide has significant potential to negatively impact water resources, mitigation techniques must be put in place to address risks. Mitigation can include substitution of a control tactic with lower risk or using management or practices that reduce or eliminate negative impacts.

Do not apply pesticides when conditions are adverse for proper placement, retention or effectiveness, such as during wind, rainfall, high water saturation in soils, and high soil or air temperatures.

Pesticide application records must be kept in accordance with Pennsylvania Department of Agriculture requirements in the Pa. Pesticide Control Act of 1973. Pesticide application records must be maintained for at least three years.

## **CONSIDERATIONS**

### **A. General**

1. Use crop rotations and pest resistant crop varieties and hybrids as a critical part of the program.
2. Use pest-free seeds and transplants.
3. Consider the effect of previous crop(s) on pest populations, and if potential future crops could be affected by current crop and management practices.
4. Optimize plant growth environment by appropriate seedbed preparation and planting techniques.
5. Maintain optimum soil fertility and pH levels for the crop(s) being raised.
6. Consider the use of tillage to reduce pest populations. Recognize that tillage can have negative impacts on soil structure and can reduce or eliminate soil cover.
7. Manage ground cover to retain soil moisture where inadequate moisture is a limiting factor to plant growth and development.
8. Avoid activities on wet soil that contribute to soil compaction. Compaction can restrict root growth and limit water and nutrient uptake.

9. Use appropriate sanitation practices (pruning, mowing, removal of diseased or infested plant material, elimination of alternate hosts, etc.) to avoid sites for pest carryover and life cycle completion. Evaluate adjacent areas that may provide habitat or host plants that contribute to the maintenance or buildup of pest populations.
10. Avoid spreading of pests to new areas by equipment.
11. Consider companion plantings or trap crops that may attract pests away from primary crops and/or provide habitat for beneficial insects.
12. Adjust planting and harvesting dates to reduce pest problems and to take advantage of best growth and development periods for the crop.
13. When possible, use pest and weather forecasting information, if available, for predicting pest trends.
14. When possible, make use of natural or commercial biological controls such as predators, parasites, nematodes, and pest diseases.
15. When possible, make use of hand weeding or spot spraying for small, isolated areas, recognizing this will increase labor costs. Do not allow weeds to go to seed.
16. When possible, make use of physical or mechanical controls such as exclusion barriers or mulches.
17. When chemical controls are being used, use the least toxic, least persistent chemical needed to control the pest. When possible use biorationals such as pheromones, repellents, minerals, oils, botanicals or microbial controls.
18. Avoid repetitive use of pesticides from the same pesticide class to reduce pest resistance and shifts in the pest types.
19. Consider pesticide characteristics such as solubility, toxicity, degradation products, mobility, persistence, adsorption, and efficacy, and relationships to site characteristics such as soil, geology, depth to water table, proximity to surface water, topography, climate, and sensitive environmental elements to determine the potential impact on water quality.
20. The method of pesticide application, such as ground or aerial spraying, wicking, granules, etc., is important since the degree of drift and volatilization can vary considerably.

## **PLANS AND SPECIFICATIONS**

### **A. General Requirements for Plans**

1. Plans and Specifications shall be prepared in accordance with the requirements of this standard, and shall describe the site-specific requirements for applying the practice to achieve its intended purpose(s).
2. Operation and Maintenance documents shall specify the requirements for installing the practice such as the kind, amount of material(s) and/or procedures to be used and the timing or sequence of actions to be taken. All specifications will be consistent with federal, state and local regulations.
3. All methods of pest management must be integrated with other management practices and components of the conservation plan, including but not limited to soil conservation and nutrient management systems.

Specific issues that must be coordinated include crop rotation, tillage, residue management, manure application and incorporation, and field layout and size.

Consider the effects of erosion control practices, including subsurface water management, on transport of adsorbed and dissolved pesticides.

The operator's desire to have the option to use specific management practices or rotation options may require inclusion of additional conservation practices to provide increased flexibility while protecting resources.

## **B. Developing a Pest Management Program**

1. Develop a farm and field identification system for the management units (farms, fields, sub-fields, etc.). Consider using a single coordinated identification system for all farm management programs and practices.
2. Inventory and evaluate field features, natural resources and sensitive areas. These include soil types, wells, springs and seeps, streams and drainage ways, ponds, and sinkholes. Include conservation plan maps, soil survey maps, location of sensitive resources and setbacks, interpretation of environmental risk analysis and identification of appropriate mitigation techniques, drawings, job sheets, operation and maintenance requirements, and other similar documents.
3. Develop a general pest management program addressing crop selection and rotations, cultural practices, soils, weather. Identify expected target pest(s), the life cycle periods when it is most vulnerable to control, and the best mechanical, biological, or chemical control method or combinations of control and list limitations on use. Incorporate integrated, multiple controls before pests become a problem, to suppress pest populations below economic threshold levels. This increases the chance of success, reduces reliance on any one tactic, delays resistance to pesticides and reduces the need for emergency actions that usually involve a limited choice of chemical alternatives.
4. Determine minimum pest management decision time frames and processes to be used, based on crop guidelines and specific pest management situations. More frequent

cycles can be used if needed. Depending on the pest situation, decisions can be made as frequently as daily or as infrequently as once every several years.

5. If chemical controls are being considered, read all label requirements for the products being considered. Address all requirements that can be met before the product needs to be used. For advice and assistance with emergency spills that involve agrichemicals, the local emergency telephone number should be provided.
6. Develop a record keeping system appropriate for the crop(s) being raised or resource being protected. For more information consult references listed at the end of this standard. As a minimum, the system should provide for recording:
  - a. Crop Selection and Rotation
    1. Previous crops.
    2. Present crops.  
Cultivar/variety
  - b. Cultural Practices
    1. Type(s) of tillage used.
    2. Planting and harvesting dates.
  - c. Soil Fertility
    1. Soil test results
    2. Nutrients applied
    3. Prior manure or other organic amendments.
    4. Prior legume crops
  - d. Pests
    1. Identified pests
    2. Population Levels
  - e. Control tactics
 

Tactic(s) used  
Pesticide information required by federal and state regulations.  
Results of Control Efforts
  - f. Maintain records for at least three years.

## **OPERATION AND MAINTENANCE**

### **A. General**

1. At least once each year, review Plans and Specifications and make appropriate changes.
2. Changes in nature or scale of agricultural enterprises, changes in associated management programs, or changes in management units included in the operation require revision of the pest management program. Changes or improvements in technology, practices and procedures may require revisions in the pest management program.
3. Maintain mechanical equipment in good working condition and calibrate application equipment according to Extension and/or manufacturer recommendations to ensure recommended rates are applied. Replace worn components of pesticide application equipment as well as other pest management implements.

### **B. Monitoring**

1. Based on the pest management plan for the specific crop(s) being grown, monitor fields using appropriate scouting and/or trapping techniques to detect pests common to planned crops and to evaluate crop condition and other considerations.

If pests are present, confirm their identity and determine their population level, life cycle and trends. Determine the economic threshold or other tolerance levels for the crop and the life cycle periods when pests are most vulnerable to control.

3. Document results of monitoring in the record keeping system. Identify appropriate management units where pests require control. If someone other than the operator is monitoring fields, the operator should be

provided with a copy of the monitoring report or records and recommendations developed from it.

### **C. Management Strategy After Pests Are Identified**

1. Determine the best cultural, biological, genetic or chemical control method or combinations of control and list limitations on use. Select control tactic(s) based on planning considerations, goals and objectives, and record tactic(s) used in the record keeping system.
2. All specifications and tactics will be consistent with federal, state and local regulations.
3. Monitor effectiveness of control tactic(s). If adjustments are made in the pest management plan, coordinate with other conservation practices and systems.

### **D. Pesticide Safety**

1. Be sure the applicator knows the exact field location(s) to be treated.
2. Safely store and re-use sprayer rinse water in subsequent batches of the same pesticide or rinse equipment in fields being treated and immediately spray rinsate on that field.
3. Mix chemicals and rinse equipment in locations with minimal potential for contamination of ground or surface water. Provide for managing accidental spills. Unless additional structural or management practices are used to protect water quality, mix chemicals down gradient and a minimum of 100 feet from a well and a minimum of 100 feet from a surface water body.
4. Ensure that back flow prevention devices are installed and operating properly on irrigation systems used for applying pesticides.

5. Post signs according to label directions or state and Federal laws around fields that have been treated.
6. Follow the established re-entry time as stated on the product label.
7. Dispose of pesticides and pesticide containers in accordance with label directions and adhere to Federal, State, and local regulations. Use Pa. Dept. of Agriculture's ChemSweep and container recycling programs where available.

## **REFERENCES**

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2. Field Crop IPM Training and Resource Manual (1997), Pennsylvania State University, College of Agricultural Sciences, Department of Entomology, (814) 863-4640. <http://www.cas.psu.edu/docs/CASDEPT/IPM/FldCrop/default.html>
3. Field Crop Scouting Manual: A Guide to Identifying & Diagnosing Pest Problems, University of Illinois, Pub X880b, Urbana IL, (217) 333-3871. <http://www.aces.uiuc.edu/~vo-ag/agrmisc.htm>
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12. Weeds of the Northeast (1997), Cornell University, Uva, Neal, DiTomaso, Cornell University Press

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4. IPM Guidelines for Processing Tomatoes (New York, New Jersey, PA) (1997), Draft checklist available from Penn State, Dept. of Entomology., University Park (814) 863-4640.
5. Northeast Sweet Corn Production and IPM Manual (1996), R.G. Adams and J.C. Clark, University of Connecticut, Resource Center U-35, 1376 Storrs Rd., Storrs, CT 06269-4035.
6. Insect and Related Pests of Vegetables, K.A. Sorenson and J.R. Baker (1994), AG 136, North Carolina Ag. Ext. Service, Dept. of Ag Communications, North Carolina State University, Raleigh, NC 27650.
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2. Pesticide Education Office, Penn State (814) 863-0263 web site: <http://www.pested.psu.edu> email: [pesticide@psu.psu.edu](mailto:pesticide@psu.psu.edu)
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